VEHICLE ACCIDENT NOTIFICATION SYSTEM

Patent Number: JP8287386
Publication date: 1996-11-01
Inventor(s): YANAGI EIJI
Applicant(s): TAKATA KK
Requested Patent: ⌜ JP8287386
Application Number: JP19950116344 19950417
Priority Number(s):
IPC Classification: G08B25/10; B60R21/32; G08B21/00; G08G1/13; H04M11/04
EC Classification:
Equivalents:

Abstract

PURPOSE: To automatically notify the fist-aid notification at the time of the generation of an accident from the side of the person involved in the accident to a prescribed first-aid system.
CONSTITUTION: The present positional information when an automobile runs based on the measured data obtained by acquiring the GPS satellite 1 that a navigation system 10 for automobile possesses is requested by the positional information request circuit within a control unit 20 at prescribed time interval. The read present positional information is stored in a memory circuit 21. Next, whether an air bag device 30 is operated or not is decided based on the shock detection signal from a shock detection sensor SG by a collision state decision circuit. Subsequently, after the signal operating at least the air bag device 30 is outputted, the present positional information stored in the memory circuit 21 is outputted as first-aid signal transmission data to a communication means 40 by a first-aid signal transmission command circuit. The transmission data is transmitted to a prescribed radio facility 2 having a first-aid command system via the communication means 40 and the generation of an accident is notified.

Data supplied from the **esp@cenet** database - I2

PATENT ABSTRACTS OF JAPAN

(11)Publication number : **08-287386**

(43)Date of publication of application : **01.11.1996**

(51)Int.Cl. G08B 25/10
B60R 21/32
G08B 21/00
G08G 1/13
H04M 11/04

(21)Application number : **07-116344**

(22)Date of filing : **17.04.1995**

(71)Applicant : **TAKATA KK**

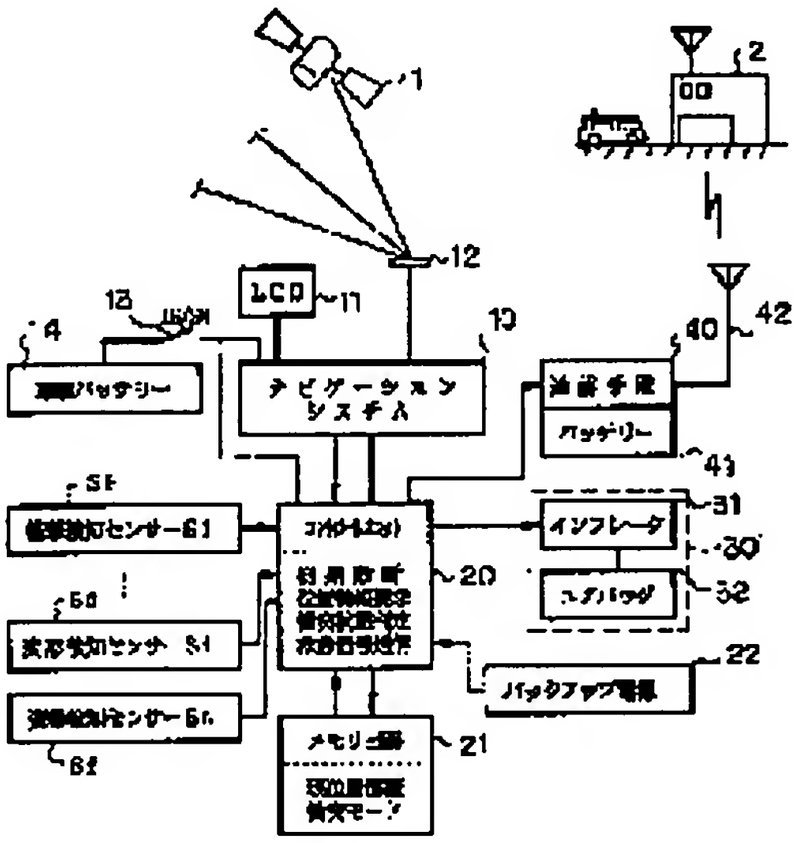
(72)Inventor : **YANAGI EIJI**

(54) VEHICLE ACCIDENT NOTIFICATION SYSTEM

(57)Abstract:

PURPOSE: To automatically notify the fist-aid notification at the time of the generation of an accident from the side of the person involved in the accident to a prescribed first-aid system.

CONSTITUTION: The present positional information when an automobile runs based on the measured data obtained by acquiring the GPS satellite 1 that a navigation system 10 for automobile possesses is requested by the positional information request circuit within a control unit 20 at prescribed time interval. The read present positional information is stored in a memory circuit 21. Next, whether an air bag device 30 is operated or not is decided based on the shock detection signal from a shock detection sensor SG by a collision state decision circuit. Subsequently, after the signal operating at least the air bag device 30 is outputted, the present positional information stored in the memory circuit 21 is outputted as first-aid signal transmission data to a communication means 40 by a first-aid signal transmission command circuit. The transmission data is transmitted to a prescribed radio facility 2 having a first-aid command system via the communication means 40 and the generation of an accident is notified.



LEGAL STATUS

[Date of request for examination]	31.07.2001
[Date of sending the examiner's decision of rejection]	10.02.2004
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]	
[Date of final disposal for application]	
[Patent number]	
[Date of registration]	
[Number of appeal against examiner's decision of rejection]	
[Date of requesting appeal against examiner's decision of rejection]	
[Date of extinction of right]	

Copyright (C); 1998,2003 Japan Patent Office

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] While requiring the present positional information at the time of the transit based on said positioning data as air bag equipment and the navigation system for automobiles which holds the positioning data which caught the GPS Satellite and were obtained at intervals of predetermined time The positional information demand circuit which accumulates said read present positional information in a memory circuit, The collision condition judging circuit which judges whether said air bag equipment is operated based on the impact detection signal from an impact detection sensor, The control unit which has the emergency signal transmitting command circuit which outputs said present positional information accumulated in said memory circuit as emergency signal transmit data after the signal which operates said air bag equipment at least is outputted, Car Incident Reporting System characterized by having the means of communications which transmits said emergency signal transmit data to the predetermined radio aids which have emergency command organization, and notifies the occurrence of accident to them.
[Claim 2] Said present positional information is car Incident Reporting System according to claim 1 characterized by accumulating LAT data, LONG data, and transit bearing in RAM in said memory circuit at least.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to car Incident Reporting System which enabled it to perform a quick and exact emergency activity by starting car Incident Reporting System, especially notifying accident occurrence positional information as an emergency signal at the time of the occurrence of a motor vehicle collision.
[0002]
[Description of the Prior Art] Air bag equipment has been adopted as many types of a car as an auxiliary arresting gear which protects crew from the impulse force produced at the time of an automobile collision effectively. The purpose of this air bag equipment is caught with the bag-like cushion gas was [cushion] full of the body especially head, and thorax of the crew who moved ahead in the condition of having been restrained by seat belt equipment at the time of a collision, and is to prevent crew from an in-the-car secondary collision. Thus, by latest automobile, even if a collision occurs, the policy which makes damage by collision the minimum by equipment for the security after the collision of seat belt equipment, air bag equipment, etc. is taken.
[0003] On the other hand, when it was the accident in which extent is light when a collision etc. happens, the crew of an accident vehicle notified the source location of accident, and the situation of accident to the police station or the fire department by the emergency phone which has him in a public telephone or a road side by itself, and was waiting for arrival of an ambulance etc. Moreover, when crew resulted a serious injury and negative was unconscious, unless the report of the accident from the neighboring witness was received, the rescue crew was not able to acquire information on the occurrence of accident. Thus, unlike the train by which operation management is carried out periodically, in a mobile like an automobile, the others were not able to know the present location serially. On the other hand, the so-called navigation system for automobiles has spread quickly for a common car as an example of application of GPS (full-terrestrial positioning system: Global Positioning Sysytem) which used the satellite in recent years. For this reason, by the car which carries the navigation system for automobiles, the positional information of a self-vehicle can be immediately acquired now based on a GPS positioning result.
[0004]
[Problem(s) to be Solved by the Invention] By the way, a collision of a car recognizes extent of a collision electrically with air bag equipment based on detection signals, such as impact acceleration at the time of the collision to which the control unit has been sent from the collision detection sensor. Furthermore, it judges whether air bag equipment is operated. And the Squibb signal (ignition signal) as a command signal of air bag equipment of operation is outputted to an inflator if needed. Now, air bag equipment itself demonstrates an original function, and the actuation as insurance equipment completes it.
[0005] On the other hand, at the above-mentioned navigation system for automobiles, the information on the location of a car etc. is displayed into the electronic map on a display on real time at the time of transit.

Thereby, crew can check the positional information of a self-vehicle visually on a map. However, since this positional information is updated at intervals of predetermined time based on GPS positioning data, it remains in the check of the positional information in that time. Thus, as equipment whose one side secures crew's insurance, another side constituted the system which became independent as equipment for assistance of transit of an automobile, respectively. While especially the navigation system for automobiles held the present positional information at the time of transit, the information was not harnessed at all at the time of the occurrence of accident.

[0006] Then, it is in the purpose of this invention offering car Incident Reporting System it enabled it to transmit to the radio-aids station which cancels the trouble which the Prior art mentioned above has, obtains extent of further the collision at the time of the collision of an automobile as positional information by the positional information acquired by the navigation system for automobiles from a mounted sensor, and has emergency command organization by making such information into an emergency signal.

[0007]

[Means for Solving the Problem] The navigation system for automobiles which holds the positioning data which this invention caught air bag equipment and a GPS Satellite, and were obtained in order to attain the above-mentioned purpose, While requiring the present positional information at the time of the transit based on said positioning data at intervals of predetermined time The positional information demand circuit which accumulates said read present positional information in a memory circuit, The collision condition judging circuit which judges whether said air bag equipment is operated based on the impact detection signal from an impact detection sensor, The control unit which has the emergency signal transmitting command circuit which outputs said present positional information accumulated in said memory circuit as emergency signal transmit data after the signal which operates said air bag equipment at least is outputted, It is characterized by having the means of communications which transmits the transmit data as said emergency signal to the predetermined radio aids which have emergency command organization, and notifies the occurrence of accident to them.

[0008] As for said present positional information, it is desirable to accumulate LAT data, LONG data, and transit bearing in RAM in said memory circuit at least.

[0009]

[Function] According to this invention, the present positional information at the time of the transit based on the positioning data which caught the GPS Satellite which the navigation system for automobiles holds, and were obtained While requiring at intervals of predetermined time by the positional information demand circuit in a control unit Accumulate said read present positional information in a memory circuit, and it judges whether air bag equipment is operated based on the impact detection signal from an impact detection sensor in a collision condition judging circuit. After the signal which operates said air bag equipment at least is outputted It outputs to means of communications by using as emergency signal transmit data said present positional information accumulated in said memory circuit by the emergency signal transmitting command circuit. Since an accident occurrence location can be checked at an early stage at the time of the occurrence of accident by transmitting the transmit data as said emergency signal to the predetermined radio aids which have emergency command organization through this means of communications, and having notified the occurrence of accident to them An emergency car etc. can mobilize and arrive quickly and can perform quickly treatment after accident, transportation in the injured's hospital, and hold.

[0010] As said present positional information, the location of an accident site can be correctly checked based on the run state of the automobile at the time of transit by accumulating LAT data, LONG data, and transit bearing in RAM in said memory circuit at least.

[0011]

[Example] One example of car Incident Reporting System by this invention is explained with reference to an accompanying drawing below. Drawing 1 is the system configuration Fig. of car Incident Reporting

System. The navigation system for automobiles in drawing (it is hereafter described as a navigation system 10.) can use any type of the hybrid system which used together the GPS method or autonomous navigation developed and marketed now. The display 11 of LCD etc. is connected to this navigation system 10 so that crew can check positional information on a map. Moreover, the GPS signal caught and acquired receives GPS Satellite 1 with the GPS antenna 12 attached in the car-body roof. In this example, the thing of eight parallel is used for the receiving method. If Lee Moto Contra's (not shown) switch is turned on like the well-known navigation system 10 when using a navigation system 10 at the time of transit, predetermined information and a predetermined menu will be displayed on a display 11. In the navigation system 10, the various positional information and related information pass the positional information correction program of GPS received data and a system are held. Among these, the vehicle speed besides the LAT as the master data and LONG information and a transit vector are handed over by the control unit 20.

[0012] A control unit 20 is a control unit which consisted of 1 chips MPU, and consists of the initial diagnostic circuit, a positional information demand circuit, a collision condition judging circuit, and an emergency signal transmitting command circuit greatly at this example. Among these, an initial diagnostic circuit is a circuit which checks normal actuation of various circuits and various sensors before transit. If a driver changes an ignition switch 13 into an energization condition, a dummy signal will flow in an initial diagnostic circuit, and the existence of the abnormalities of opening of a circuit, short-circuit, or each part will be checked.

[0013] A positional information demand circuit outputs the signal which the positional information of the present location which a navigation system 10 holds to a navigation system 10 at intervals of predetermined time requires. On the other hand, from a navigation system 10 side, the positional information of a predetermined data format is outputted irrespective of ON of a navigation system 10, and an OFF condition to a control unit 20.

[0014] Among this positional information, GPS received data are still sufficient as the LAT and LONG information, and the information amended through correction programs, such as autonomous navigation, is sufficient as them. In addition, although not shown in drawing 1 , when Differential GPS (DGPS) is adopted, it is desirable to have the receiver which receives the DGPS data link transmitted from a criteria office. And you may make it a control unit 20 require the data amended with differential amendment data of a navigation system 10. The well-known judgment circuit for operating air bag equipment 30 can be used for a collision condition judging circuit. Usually, when the detection signal from the carried impact detection sensor SG exceeds a predetermined threshold impact resistance value, the Squibb signal to an inflator 31 is outputted. Moreover, the insurance sensor for explosion-by-mistake prevention besides the impact detection sensor SG may be carried, and the AND circuit of an insurance sensor and the impact detection sensor SG may be formed.

[0015] On the other hand, in order to operate air bag equipment 30, two or more detection sensors Si (i=1-n) are connected to the collision condition judging circuit of a control unit 20. These detection sensor Si is directly distinguishable in the impact detection sensor SG related to expansion of an air bag 30, and the additional sensor for acquiring the collision status information at the time of an accident report, although it does not contribute to actuation of air bag equipment directly. There is a deformation detection sensor Sd as a latter example. This can grasp an accident situation independently [the impact detection sensor SG], when the frame and side door beam of the body are equipped and a door and a frame are greatly distorted by side collision etc. Moreover, when a car sideslips, it can be recognized as the attitude-sensing sensor Sf detecting the unusual inclination of a car, and being in an accident condition. It is also desirable to also prepare the cross member of RIYA the impact detection sensor SG or the deformation detection sensor Sd. When a detection signal which exceeds a predetermined threshold also when impulse force is not inputted in the direction which operates air bag equipment 30 by this is outputted, an accident report can be carried out under the condition that a major accident occurs. Moreover, an outbreak of the fire

accompanying accident can also be known by carrying the temperature detection sensor. A serious damage part can know various collision conditions, such as somewhere, for whether a collision being a head-on collision, and it being a slanting collision, being a side collision, or being a rear-end collision or a car body is greatly damaged from these detection signal values and signal patterns. This collision condition is made to collate with the collision mode stored in the condition of having been systematically classified into the memory circuit, can put that collision mode information on an emergency signal with positional information as information in case of accident, and can also be transmitted.

[0016] A memory circuit 21 consists of an EEPROM which classifies systematically the collision condition corresponding to RAM which can accumulate the present positional information and collision mode information, a car-body number and a type of a car, owner information and the detection signal value acquired from various kinds of detection sensors at the time of the occurrence of accident, and a signal pattern, and is carrying out storage storing as collision mode.

[0017] In the emergency signal transmitting command circuit of a control unit 20, when the detecting signal of a predetermined detection sensor exceeds a threshold and can recognize it as the occurrence of a major accident although an inflator-on judging comes out and drops off after the Squibb signal of Inflator ON is outputted or, the newest reasonable positional information stored in RAM and the collision mode information at the time of a collision are read, and data are sent to means of communications 40.

[0018] A backup power supply 22 is a standby power source when the current supply to a control unit 20 is cut off by breakage of the mounted dc-battery 14, and open circuit of electric wiring. A mass capacitor is used and it is in the condition of always charging. Even if wiring is disconnected by breakage of a car body etc. by this, the collision condition judging circuit in a control unit 20, an emergency signal sending circuit, and RAM are backed up, and reservation of circuit actuation and memory disappearance can be prevented.

[0019] The inflator 31 and air bag 32 which constitute air bag equipment 30 are well-known equipment. If it is judged with Inflator ON by the collision judgement by the control unit 20, an inflator 31 operates with the Squibb signal from a control unit 20, and it has come to be able to carry out the expansion expansion of the air bag 30.

[0020] As means of communications 40, the land mobile radiotelephone is used by this example. Auto dialing of the emergency call is carried out to the radio aids 2 which are transmission places by the emergency signal sending circuit, and as a tone signal, the car-body number as initial data, a type of a car, owner information, and the accident occurrence positional information and collision mode information that were accumulated in RAM are repeatedly transmitted until a response check of a phase hand is carried out. As this means of communications 40, well-known various means of communications, such as cellular phones, such as a cellular phone, personal communications, semi- microwave band (1-3GHz) wireless, and mobile satellite communication, are employable. Moreover, the situation of the circumference obtained with the FM multiplex broadcast, the optical beacon, and the electric-wave beacon as location auxiliary information around an accident site can also be transmitted collectively. In addition, means of communications 40 has the dc-battery 41 of dedication. It is desirable to consider as the equipment which checks whenever [exhausting / this dc-battery 41] in the initial diagnostic circuit of a control unit 20, and can be charged if needed.

[0021] In the case of a public line, as radio aids 2 equipped with the emergency command organization of a transmission place, the organization of the police which receives an emergency call is mentioned as an example. Moreover, while notifying a specific security firm using a personal radio, mobile satellite communication, etc. and having No. 119 and No. 110 contact from there, the original exchange organization of a security firm can also be received. Although various signaling protocols of an emergency signal and data formats are considered, if predetermined emergency data are first transmitted from an accident vehicle by one direction communication link and completion of data transmission and reception is checked, you may set up so that it may become the analog two-way communication as the conversational

mode. If it is in the condition that the crew of an accident vehicle can talk at this time, the emergency establishment can know the situation of more detailed accident, and the injured's condition.
[0022] Drawing 2 is the mimetic diagram having shown the example which carried the structure-of-a-system element shown in drawing 1 in the real vehicle. The navigation system 10 and the control unit 20 are arranged at the cockpit front part. Furthermore, the LCD display 11 is built into the instrument panel. The Squibb signal line is connected to the inflator 31 held in the steering wheel from the control unit 20. On the other hand, the flat disc-like GPS antenna 12 is being fixed to the roof posterior part. Hold maintenance of the communication device 40 is carried out at the high part of car-body rigidity near the rear wheel axle. The pole antenna 42 is installed from the car body of a rear trunk location. As a sensor, the front impact detection sensor SG1, the rear impact detection sensor SG2, and the deformation detection sensor Sd (side door beam) are illustrated in instantiation.
[0023] Next, the sequence of a control unit 20 of operation is explained with reference to drawing 3 . First, when a driver makes an ignition switch 13 ACC or ON, it energizes from the mounted dc-battery 14, and an initial diagnostic circuit program is performed (step 100,110). When abnormalities are discovered at this time, it carries out carrying out continuation lighting of the alarm lamp of for example, an instrument panel etc., and the abnormalities of a system are told to a driver. Subsequently, auto-boot of the positioning data update circuit of a navigation system 10 is carried out (step 120). Although it is not indicated by the display when the body of a navigation system 10 will be in ON condition at this time, renewal of the positioning data as positional information is performed. Regular spacing (for example, deltat= 1 second) is sufficient as the interval of this updating time amount, and it is a rate induction method, and it may be made to make spacing small as a rate increases. A positional information demand signal is outputted from a control unit 20 to this navigation system 10 (step 130). The newest present positional information is read from a navigation system 10, and it is written in RAM. Moreover, the output signal from each sensor can be serially incorporated now in a collision condition judging circuit during transit. In a collision condition judging circuit, it corresponds to the sensor detection signal Si and the sensor detection signal Si, and the comparison with the threshold Thi recognized to be a collision is performed (step 160), if the sensor detection signal Si is more than threshold Thi, it will be judged as the required major accident of an accident report, and the judgment of being the collision applicable to Inflator ON is performed (step 162). If it is an inflator-on judging, the Squibb signal will be outputted to an inflator (step 180). On the other hand, since it is judged with the major accident even if it is the collision which does not expand an air bag 30, the positional information and collision mode information which are written in RAM are read, and the command which an emergency signal is made to transmit to the radio aids which have predetermined emergency organization by means of communications is outputted (step 200).
[0024] On the other hand, when the sensor detection signal Si is less than the threshold Thi, it is at the time at which it can usually run, and it continues during transit in this case, a positional information demand is repeated, and the positional information in RAM is updated to the newest thing. Although transit termination is carried out, and it changes an ignition switch 13 into an OFF condition in getting off, the positioning data update circuit of a navigation system 10 also serves as OFF at this time (step 170,210).
[0025] In addition, although collision mode information is also accumulated in RAM besides positional information in the above explanation, information indispensable as an emergency signal is positional information, and collision mode information is additional information. Therefore, also when it considers as the system which collects collision mode information as collection data or collects, it can be chosen whether it is adopted as transmit information.
[0026]
[Effect of the Invention] According to this invention, emergency signals, such as an accident occurrence location, can be notified to the radio aids which have predetermined emergency command organization it not only secures crew's insurance at the time of a collision, but, and the effectiveness that transportation in a hospital, hold, etc. can ensure reservation of the insurance of the crew after accident is done so so that

clearly from the above explanation.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

TECHNICAL FIELD

[Industrial Application] This invention relates to car Incident Reporting System which enabled it to perform a quick and exact emergency activity by starting car Incident Reporting System, especially notifying accident occurrence positional information as an emergency signal at the time of the occurrence of a motor vehicle collision.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

PRIOR ART

[Description of the Prior Art] Air bag equipment has been adopted as many types of a car as an auxiliary arresting gear which protects crew from the impulse force produced at the time of an automobile collision effectively. The purpose of this air bag equipment is caught with the bag-like cushion gas was [cushion] full of the body especially head, and thorax of the crew who moved ahead in the condition of having been restrained by seat belt equipment at the time of a collision, and is to prevent crew from an in-the-car secondary collision. Thus, by latest automobile, even if a collision occurs, the policy which makes damage by collision the minimum by equipment for the security after the collision of seat belt equipment, air bag equipment, etc. is taken.

[0003] On the other hand, when it was the accident in which extent is light when a collision etc. happens, the crew of an accident vehicle notified the source location of accident, and the situation of accident to the police station or the fire department by the emergency phone which has him in a public telephone or a road side by itself, and was waiting for arrival of an ambulance etc. Moreover, when crew resulted a serious injury and negative was unconscious, unless the report of the accident from the neighboring witness was received, the rescue crew was not able to acquire information on the occurrence of accident. Thus, unlike the train by which operation management is carried out periodically, in a mobile like an automobile, the others were not able to know the present location serially. On the other hand, the so-called navigation system for automobiles has spread quickly for a common car as an example of application of GPS (full-terrestrial positioning system: Global Positioning Sysytem) which used the satellite in recent years. For this reason, by the car which carries the navigation system for automobiles, the positional information of a self-vehicle can be immediately acquired now based on a GPS positioning result.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, emergency signals, such as an accident occurrence location, can be notified to the radio aids which have predetermined emergency command organization it not only secures crew's insurance at the time of a collision, but, and the effectiveness that transportation in a hospital, hold, etc. can ensure reservation of the insurance of the crew after accident is done so so that clearly from the above explanation.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] By the way, a collision of a car recognizes extent of a collision electrically with air bag equipment based on detection signals, such as impact acceleration at the time of the collision to which the control unit has been sent from the collision detection sensor. Furthermore, it judges whether air bag equipment is operated. And the Squibb signal (ignition signal) as a command signal of air bag equipment of operation is outputted to an inflator if needed. Now, air bag equipment itself demonstrates an original function, and the actuation as insurance equipment completes it.
[0005] On the other hand, at the above-mentioned navigation system for automobiles, the information on the location of a car etc. is displayed into the electronic map on a display on real time at the time of transit. Thereby, crew can check the positional information of a self-vehicle visually on a map. However, since this positional information is updated at intervals of predetermined time based on GPS positioning data, it remains in the check of the positional information in that time. Thus, as equipment whose one side secures crew's insurance, another side constituted the system which became independent as equipment for assistance of transit of an automobile, respectively. While especially the navigation system for automobiles held the present positional information at the time of transit, the information was not harnessed at all at the time of the occurrence of accident.
[0006] Then, it is in the purpose of this invention offering car Incident Reporting System it enabled it to transmit to the radio-aids station which cancels the trouble which the Prior art mentioned above has, obtains extent of further the collision at the time of the collision of an automobile as positional information by the positional information acquired by the navigation system for automobiles from a mounted sensor, and has emergency command organization by making such information into an emergency signal.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose, this invention is characterized by having the control unit and the means of communications which transmits the transmit data as said emergency signal to the predetermined radio aids which have emergency command organization, and notifies the occurrence of accident to them characterized by providing the following. Air bag equipment The navigation system for automobiles which holds the positioning data which caught the GPS Satellite and were obtained The positional information demand circuit which accumulates said read present positional information in a memory circuit while requiring the present positional information at the time of the transit based on said positioning data at intervals of predetermined time The collision condition judging circuit which judges whether said air bag equipment is operated based on the impact detection signal from an impact detection sensor, and the emergency signal transmitting command circuit which outputs said present positional information accumulated in said memory circuit as emergency signal transmit data after the signal which operates said air bag equipment at least is outputted
[0008] As for said present positional information, it is desirable to accumulate LAT data, LONG data, and transit bearing in RAM in said memory circuit at least.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

OPERATION

[Function] While requiring the present positional information at the time of the transit based on the positioning data which caught the GPS Satellite which the navigation system for automobiles holds in this invention, and were obtained at intervals of predetermined time by the positional information demand circuit in a control unit Accumulate said read present positional information in a memory circuit, and it judges whether air bag equipment is operated based on the impact detection signal from an impact detection sensor in a collision condition judging circuit. After the signal which operates said air bag equipment at least is outputted It outputs to means of communications by using as emergency signal transmit data said present positional information accumulated in said memory circuit by the emergency signal transmitting command circuit. An accident occurrence location can be checked at an early stage at the time of the occurrence of accident by transmitting the transmit data as said emergency signal to the predetermined radio aids which have emergency command organization through this means of communications, and having notified the occurrence of accident to them. Therefore, an emergency car etc. can mobilize and arrive quickly and can perform quickly treatment after accident, transportation in the injured's hospital, and hold.
[0010] As said present positional information, the location of an accident site can be correctly checked based on the run state of the automobile at the time of transit by accumulating LAT data, LONG data, and transit bearing in RAM in said memory circuit at least.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

EXAMPLE

[Example] One example of car Incident Reporting System by this invention is explained with reference to an accompanying drawing below. Drawing 1 is the system configuration Fig. of car Incident Reporting System. The navigation system for automobiles in drawing (it is hereafter described as a navigation system 10.) can use any type of the hybrid system which used together the GPS method or autonomous navigation developed and marketed now. The display 11 of LCD etc. is connected to this navigation system 10 so that crew can check positional information on a map. Moreover, the GPS signal caught and acquired receives GPS Satellite 1 with the GPS antenna 12 attached in the car-body roof. In this example, the thing of eight parallel is used for the receiving method. If Lee Moto Contra's (not shown) switch is turned on like the well-known navigation system 10 when using a navigation system 10 at the time of transit, predetermined information and a predetermined menu will be displayed on a display 11. In the navigation system 10, the various positional information and related information pass the positional information correction program of GPS received data and a system are held. Among these, the vehicle speed besides the LAT as the master data and LONG information and a transit vector are handed over by the control unit 20.

[0012] A control unit 20 is a control unit which consisted of 1 chips MPU, and consists of the initial diagnostic circuit, a positional information demand circuit, a collision condition judging circuit, and an emergency signal transmitting command circuit greatly at this example. Among these, an initial diagnostic circuit is a circuit which checks normal actuation of various circuits and various sensors before transit. If a driver changes an ignition switch 13 into an energization condition, a dummy signal will flow in an initial diagnostic circuit, and the existence of the abnormalities of opening of a circuit, short-circuit, or each part will be checked.

[0013] A positional information demand circuit outputs the signal which the positional information of the present location which a navigation system 10 holds to a navigation system 10 at intervals of predetermined time requires. On the other hand, from a navigation system 10 side, the positional information of a predetermined data format is outputted irrespective of ON of a navigation system 10, and an OFF condition to a control unit 20.

[0014] Among this positional information, GPS received data are still sufficient as the LAT and LONG information, and the information amended through correction programs, such as autonomous navigation, is sufficient as them. In addition, although not shown in drawing 1 , when Differential GPS (DGPS) is adopted, it is desirable to have the receiver which receives the DGPS data link transmitted from a criteria office. And you may make it a control unit 20 require the data amended with differential amendment data of a navigation system 10. The well-known judgment circuit for operating air bag equipment 30 can be used for a collision condition judging circuit. Usually, when the detection signal from the carried impact detection sensor SG exceeds a predetermined threshold impact resistance value, the Squibb signal to an inflator 31 is outputted. Moreover, the insurance sensor for explosion-by-mistake prevention besides the impact detection sensor SG may be carried, and the AND circuit of an insurance sensor and the impact detection

sensor SG may be formed.
[0015] On the other hand, in order to operate air bag equipment 30, two or more detection sensors Si (i=1-n) are connected to the collision condition judging circuit of a control unit 20. These detection sensor Si is directly distinguishable in the impact detection sensor SG related to expansion of an air bag 30, and the additional sensor for acquiring the collision status information at the time of an accident report, although it does not contribute to actuation of air bag equipment directly. There is a deformation detection sensor Sd as a latter example. This can grasp an accident situation independently [the impact detection sensor SG], when the frame and side door beam of the body are equipped and a door and a frame are greatly distorted by side collision etc. Moreover, when a car sideslips, it can be recognized as the attitude-sensing sensor Sf detecting the unusual inclination of a car, and being in an accident condition. It is also desirable to also prepare the cross member of RIYA the impact detection sensor SG or the deformation detection sensor Sd. When a detection signal which exceeds a predetermined threshold also when impulse force is not inputted in the direction which operates air bag equipment 30 by this is outputted, an accident report can be carried out under the condition that a major accident occurs. Moreover, an outbreak of the fire accompanying accident can also be known by carrying the temperature detection sensor. A serious damage part can know various collision conditions, such as somewhere, for whether a collision being a head-on collision, and it being a slanting collision, being a side collision, or being a rear-end collision or a car body is greatly damaged from these detection signal values and signal patterns. This collision condition is made to collate with the collision mode stored in the condition of having been systematically classified into the memory circuit, can put that collision mode information on an emergency signal with positional information as information in case of accident, and can also be transmitted.
[0016] A memory circuit 21 consists of an EEPROM which classifies systematically the collision condition corresponding to RAM which can accumulate the present positional information and collision mode information, a car-body number and a type of a car, owner information and the detection signal value acquired from various kinds of detection sensors at the time of the occurrence of accident, and a signal pattern, and is carrying out storage storing as collision mode.
[0017] In the emergency signal transmitting command circuit of a control unit 20, when the detecting signal of a predetermined detection sensor exceeds a threshold and can recognize it as the occurrence of a major accident although an inflator-on judging comes out and drops off after the Squibb signal of Inflator ON is outputted or, the newest reasonable positional information stored in RAM and the collision mode information at the time of a collision are read, and data are sent to means of communications 40.
[0018] A backup power supply 22 is a standby power source when the current supply to a control unit 20 is cut off by breakage of the mounted dc-battery 14, and open circuit of electric wiring. A mass capacitor is used and it is in the condition of always charging. Even if wiring is disconnected by breakage of a car body etc. by this, the collision condition judging circuit in a control unit 20, an emergency signal sending circuit, and RAM are backed up, and reservation of circuit actuation and memory disappearance can be prevented.
[0019] The inflator 31 and air bag 32 which constitute air bag equipment 30 are well-known equipment. If it is judged with Inflator ON by the collision judgement by the control unit 20, an inflator 31 operates with the Squibb signal from a control unit 20, and it has come to be able to carry out the expansion expansion of the air bag 30.
[0020] As means of communications 40, the land mobile radiotelephone is used by this example. Auto dialing of the emergency call is carried out to the radio aids 2 which are transmission places by the emergency signal sending circuit, and as a tone signal, the car-body number as initial data, a type of a car, owner information, and the accident occurrence positional information and collision mode information that were accumulated in RAM are repeatedly transmitted until a response check of a phase hand is carried out. As this means of communications 40, well-known various means of communications, such as cellular phones, such as a cellular phone, personal communications, semi- microwave band (1-3GHz) wireless,

and mobile satellite communication, are employable. Moreover, the situation of the circumference obtained with the FM multiplex broadcast, the optical beacon, and the electric-wave beacon as location auxiliary information around an accident site can also be transmitted collectively. In addition, means of communications 40 has the dc-battery 41 of dedication. It is desirable to consider as the equipment which checks whenever [exhausting / this dc-battery 41] in the initial diagnostic circuit of a control unit 20, and can be charged if needed.

[0021] In the case of a public line, as radio aids 2 equipped with the emergency command organization of a transmission place, the organization of the police which receives an emergency call is mentioned as an example. Moreover, while notifying a specific security firm using a personal radio, mobile satellite communication, etc. and having No. 119 and No. 110 contact from there, the original exchange organization of a security firm can also be received. Although various signaling protocols of an emergency signal and data formats are considered, if predetermined emergency data are first transmitted from an accident vehicle by one direction communication link and completion of data transmission and reception is checked, you may set up so that it may become the analog two-way communication as the conversational mode. If it is in the condition that the crew of an accident vehicle can talk at this time, the emergency establishment can know the situation of more detailed accident, and the injured's condition.

[0022] Drawing 2 is the mimetic diagram having shown the example which carried the structure-of-a-system element shown in drawing 1 in the real vehicle. The navigation system 10 and the control unit 20 are arranged at the cockpit front part. Furthermore, the LCD display 11 is built into the instrument panel. The Squibb signal line is connected to the inflator 31 held in the steering wheel from the control unit 20. On the other hand, the flat disc-like GPS antenna 12 is being fixed to the roof posterior part. Hold maintenance of the communication device 40 is carried out at the high part of car-body rigidity near the rear wheel axle. The pole antenna 42 is installed from the car body of a rear trunk location. As a sensor, the front impact detection sensor SG1, the rear impact detection sensor SG2, and the deformation detection sensor Sd (side door beam) are illustrated in instantiation.

[0023] Next, the sequence of a control unit 20 of operation is explained with reference to drawing 3 . First, when a driver makes an ignition switch 13 ACC or ON, it energizes from the mounted dc-battery 14, and an initial diagnostic circuit program is performed (step 100,110). When abnormalities are discovered at this time, it carries out carrying out continuation lighting of the alarm lamp of for example, an instrument panel etc., and the abnormalities of a system are told to a driver. Subsequently, auto-boot of the positioning data update circuit of a navigation system 10 is carried out (step 120). Although it is not indicated by the display when the body of a navigation system 10 will be in ON condition at this time, renewal of the positioning data as positional information is performed. Regular spacing (for example, deltat= 1 second) is sufficient as the interval of this updating time amount, and it is a rate induction method, and it may be made to make spacing small as a rate increases. A positional information demand signal is outputted from a control unit 20 to this navigation system 10 (step 130). The newest present positional information is read from a navigation system 10, and it is written in RAM. Moreover, the output signal from each sensor can be serially incorporated now in a collision condition judging circuit during transit. In a collision condition judging circuit, it corresponds to the sensor detection signal Si and the sensor detection signal Si, and the comparison with the threshold Thi recognized to be a collision is performed (step 160), if the sensor detection signal Si is more than threshold Thi, it will be judged as the required major accident of an accident report, and the judgment of being the collision applicable to Inflator ON is performed (step 162). If it is an inflator-on judging, the Squibb signal will be outputted to an inflator (step 180). On the other hand, since it is judged with the major accident even if it is the collision which does not expand an air bag 30, the positional information and collision mode information which are written in RAM are read, and the command which an emergency signal is made to transmit to the radio aids which have predetermined emergency organization by means of communications is outputted (step 200).

[0024] On the other hand, when the sensor detection signal Si is less than the threshold Thi, it is at the

time at which it can usually run, and it continues during transit in this case, a positional information demand is repeated, and the positional information in RAM is updated to the newest thing. Although transit termination is carried out, and it changes an ignition switch 13 into an OFF condition in getting off, the positioning data update circuit of a navigation system 10 also serves as OFF at this time (step 170,210).
[0025] In addition, although collision mode information is also accumulated in RAM besides positional information in the above explanation, information indispensable as an emergency signal is positional information, and collision mode information is additional information. Therefore, also when it considers as the system which collects collision mode information as collection data or collects, it can be chosen whether it is adopted as transmit information.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

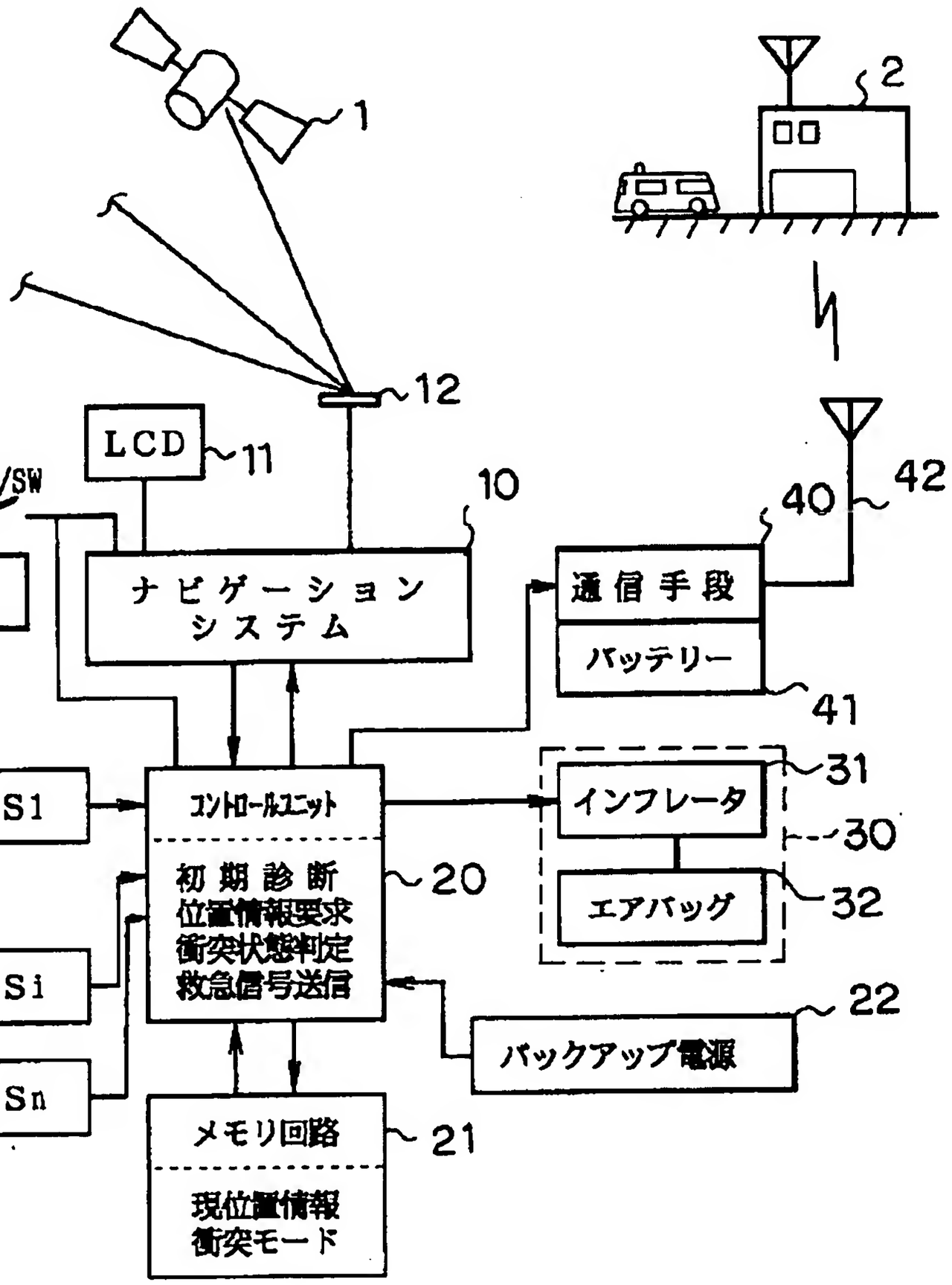
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The system configuration Fig. having shown one example of car Incident Reporting System by this invention.
[Drawing 2] The outline block diagram having shown an example which carried car Incident Reporting System in the real vehicle.
[Drawing 3] The outline flowchart which showed the flow of the control unit of car Incident Reporting System of operation.
[Description of Notations]
1 GPS Satellite
2 Transmission Place (Emergency Organization Facility)
10 Navigation System
12 GPS Antenna
20 Control Unit
21 Memory Circuit
30 Air Bag Equipment
31 Inflator
40 Means of Communications
Si Impact detection sensor

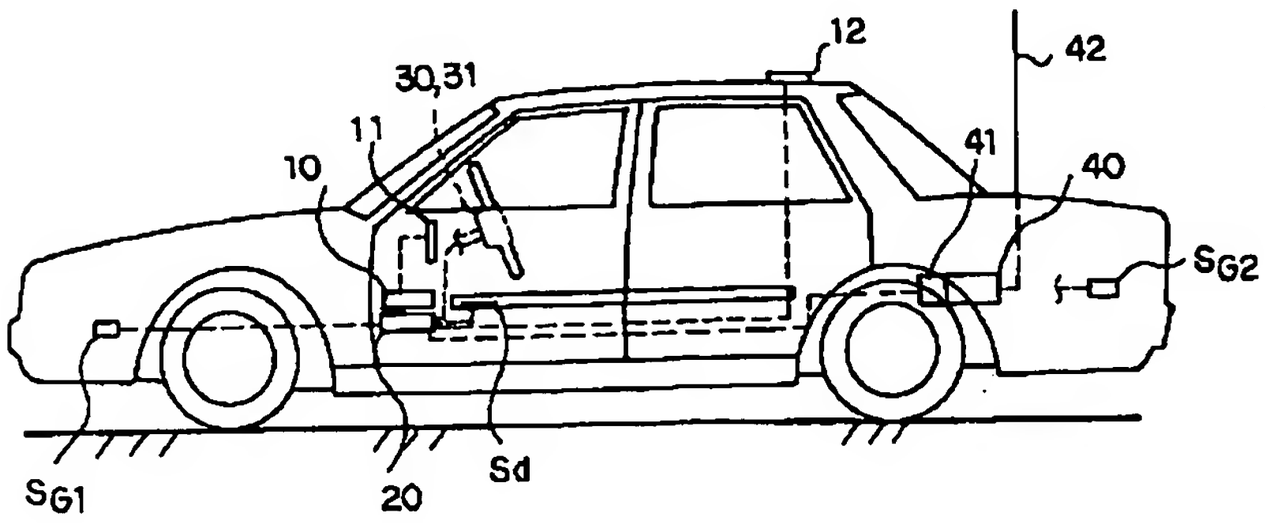
[Translation done.]

Drawing selection drawing 1



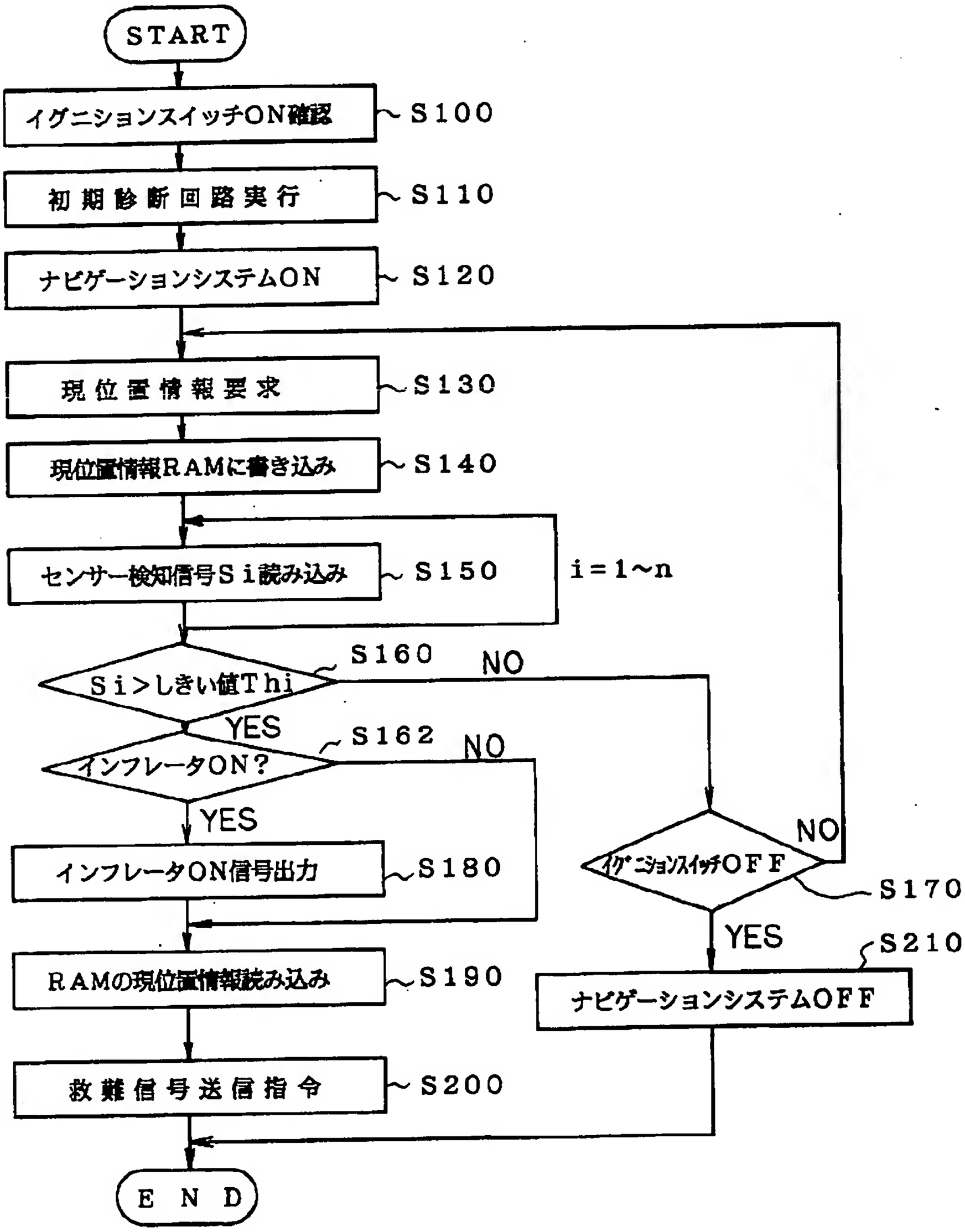
[Translation done.]

Drawing selection drawing 2



[Translation done.]

Drawing selection drawing 3



[Translation done.]